

Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

**Extremely Nonsinusoidal Emissions from Strong Laser Pulses
Obliquely P-Incident on Sharp-Edged Plasmas** Y. TYSHETSKIY, L.

NIKOLIC, T.W. JOHNSTON, F. VIDAL, INRS-EMT — Extremely high laser harmonics emissions [1] emerge from the Vulcan petawatt laser's sub-picosecond laser pulses obliquely incident on slab targets with extremely low pre-pulse energy. Similar studies are to be made using the ALLS 200 TW Ti-Saph laser (24 fs at 10 Hz with 10^{-10} contrast even without plasma mirrors). We discuss our 2-D PIC simulations using the OSIRIS code with a view to (a) understanding the basic mechanism(s) for the production of the harmonics and (b) establishing the effect of density gradients. Typical results resemble those of Naumova et al. [2], including the presence of a very large and asymmetric electromagnetic "spikes" which account for the high harmonic content.

[1] B. Dromey, M. Zepf, A. Gopal, K. Lancaster, M. S. Wei, K. Krushelnick, M. Tatarakis, N. Vakakis, S. Moustazis, R. Kodama, M. Tambo, C. Stoeckl, R. Clarke, H. Habara, D. Neely, S. Karsch and P. Norreys, *Nature Phys. Lett.*, 2, 456-459 (2006)

[2] N. Naumova, I. Sokolov, J. Nees, A. Maksimchuk, V. Yanovsky, and G. Mourou *Phys. Rev. Lett.* 93, 195003 (2004)

Tudor Johnston
INRS-EMT

Date submitted: 20 Jul 2006

Electronic form version 1.4